

Application No: 10/790,388
Amendment dated July 12, 2006
Reply to Office Action Dated June 5, 2006

Attorney Docket No: 3926.069

REMARKS

Claims 7-10 and 12-16 are now pending in the application. Claim 7 has been amended.
Claims 1-6 have been previously cancelled. Claim 11 has now been cancelled.

Specification

The Examiner indicates the disclosure is objected to because of the following informalities: claim numbers are in the specification. Reference to actual claims cannot be made in the specification because these are subject to change during prosecution.

The paragraphs [0001] and [0008] of the specification have been amended to delete the reference to claim numbers.

Double Patenting

The Examiner has stated that should claim 11 be found allowable, claim 12 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof.

Claim 11 has been cancelled.

Claim Rejections - 35 U.S.C. § 102

Claims 7, 9-10 & 14-15 are rejected under 35 U.S.C. 102(a) as being anticipated by Xie et al. (US 6,608,278).

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Applicants would like first to briefly review the present invention.

With many coated plates, in particular zinc treated and organic coated sheet metals employed in the automobile industry, the boiling point of the coating material is significantly lower than the melting point of the sheet metal material. Thus, in the case of laser welding this type of sheet metal with no gap between the sheets, an explosion-like vaporization of coating material occurs, which degrades the quality of the joints. One proposal was to use spacers to produce narrow gaps between the sheets, but it has the disadvantages of requiring long preparation and processing time and thus increasing the costs as well as causing outer surface defects. Another proposal was to provide no gap between the sheets, but to use two different laser beams to evaporate the coat and then weld the uncoated sheets. However, the disadvantage of this proposal is the complexity and expense for the equipment of the two required optical systems.

The object of the present invention is thus to reduce the necessary apparatus complexity and at the same time maintain or improve the processing quality.

The object is achieved by a process for laser welding two coated plates, which are positioned closely contacting each other, by a laser beam, the process comprising:

during a first process step the plate facing the laser beam is warmed with the laser beam in such a manner

- that the coating of both plates on their sides facing each other is evaporated, leaving a de-coated area, and

- that no plate is completely melted through, and

during a second process step the two plates are welded along the de-coated area,

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wherein both process steps are carried out by the same laser beam with substantially the same output and focusing, however, the second process step is carried out with reduced speed of advance of the laser beam over the surface.

Xie et al. disclose a no gap method for beam welding of coated materials using multiple energy beams. However, Xie et al. do not disclose using the same laser beam in two process steps wherein both process steps are carried out by the same laser beam with substantially the same output and focusing, however, the second process step is carried out with reduced speed of advance of the laser beam over the surface.

Claim 7 is therefore believed to be patentable. Claims 9-10 and 14-15 are believed to be patentable due to their dependency on independent claim 7.

Claim Rejections - 35 U.S.C. § 103

Claim 16 is rejected under 35 U.S.C. 102(a) as being unpatentable over Xie et al. Claim 8 is rejected under 35 U.S.C. 102(a) as being unpatentable over Xie et al. and further in view of Coyle, Jr. et al. (US 5,268,556). Claims 11-13 are rejected under 35 U.S.C. 102(a) as being unpatentable over Xie et al. and further in view of Mombo-Caristan (US 5,603,853).

Dependent claims 8, 12-13, and 16 are believed to be patentable due to their dependency on independent claim 7. Claim 11 has been cancelled.

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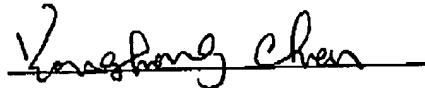
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Favorable consideration and early issuance of the Notice of Allowance are respectfully requested. Should further issues remain prior to allowance, the Examiner is respectfully requested to contact the undersigned at the indicated telephone number.

Respectfully submitted,



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